CLAIMS:

1. An arrayed waveguide-embedded optical circuit comprising:

a waveguide;

a groove formed across the waveguide; and

two or more spot-size transformer pairs whose members face each other across the groove.

2. The arrayed waveguide-embedded optical circuit in accordance with claim 1, wherein each spot-size transformer comprises at least, a first optical waveguide comprising a first core and a first cladding and a second optical waveguide comprising a second core as a extension of the first cladding and a second cladding.

3. The arrayed waveguide-embedded optical circuit in accordance with claim 2, wherein each of the spot-size transformers further comprises a transition waveguide positioned between the first optical waveguide and the second optical waveguide and is constituted so that the width of the first core becomes gradually narrower as it goes toward the second optical waveguide.

4. The arrayed waveguide-embedded optical circuit in accordance with claim 3, wherein a first cladding substantially covers the whole surface of the first core.

5. The arrayed waveguide-embedded optical circuit in accordance with claim 4, wherein the center of the first core and the center of the second core are aligned substantially on the same axis.

6. The arrayed waveguide-embedded optical circuit in accordance with claim 5, wherein the groove is formed at an angle to a plane perpendicular to the axis of the light propagating through the spot-size transformer.

7. The arrayed waveguide-embedded optical circuit in accordance with claim 6 further comprising an optical isolator element inserted in the groove.

8. The arrayed waveguide-embedded optical circuit in accordance with claim 7, wherein the optical isolator element is provided at an angle to a plane perpendicular to the axis of the light propagating through the spot-size transformer.

9. The arrayed waveguide-embedded optical circuit in accordance with claim 6 further comprising an optical filter inserted in the groove.

10. An optical functional element which can be inserted into a groove of an arrayed waveguide-embedded optical circuit which comprises a waveguide, a groove formed across the waveguide and two or more embedded optical waveguide pairs whose members face each other across the groove, wherein the optical functional element has regions for passing the light propagating through the two or more pairs of the embedded optical waveguides.

11. The optical functional element in accordance with claim 10 comprising a magneto-optic functional element, first and second birefringent plates formed on one surface of the magneto-optic functional element, and third and fourth birefringent plates formed on the other surface of the magneto-optic functional

element.

12. The optical functional element in accordance with claim 11, wherein a boundary between the first and second birefringent plates and a boundary between the third and the fourth birefringent plates coincide substantially with the direction of arrangement of the pairs of embedded optical waveguides when the optical functional element is inserted into the groove.

13. The optical functional element in accordance with claim 11, wherein the first and second birefringent plates are arranged alternately on one surface of the magneto-optic functional element and the third and fourth birefringent plates are arranged alternately on the other surface of the magneto-optic functional element.

14. The optical functional element in accordance with claim 11, wherein the first and second birefringent plates are arranged on one surface of the magneto-optic functional element in a checker pattern and the third and fourth birefringent plates are arranged on the other surface of the magneto-optic functional element in a checker pattern.

15. The optical functional element in accordance with claim 14, wherein the first and third birefringent plates are located at positions where, when the optical functional element is inserted into the groove, one half of the beam spot of the light propagating through each pair of embedded optical waveguides is projected and the second and fourth birefringent plates are located at positions where, when the optical functional element is inserted into the groove, the other half of the beam spot of the light propagating through each pair of the embedded

optical waveguides is projected.

16. The optical functional element in accordance with claim 13, wherein the first and third birefringent plates are located at positions where, when the optical functional element is inserted into the groove, the beam spot of the light propagating through a predetermined pair of the embedded optical waveguides among the two or more pairs of the embedded optical waveguides is projected and the second and fourth birefringent plates are located at positions where, when the optical functional element is inserted into the groove, the beam spot of the light propagating through another pair of the embedded optical waveguides adjacent to the predetermined pair of the embedded optical waveguide among the two or more pairs of the embedded optical waveguide is projected.

17. The optical functional element in accordance with claim 16, wherein the crystal axes of the first, second, third and fourth birefringent plate are set to +22.5 degrees, -67.5 degrees, -22.5 degrees, +67.5 degrees to a predetermined reference axis, respectively.

18. The optical functional element in accordance with claim 10 comprising a magneto-optic functional element, first birefringent plates formed on one surface of the magneto-optic functional element at predetermined intervals, and second birefringent plates formed on the other surface of the magneto-optic functional element at predetermined intervals.

19. The optical functional element in accordance with claim 18 comprising the first and second birefringent plates to be located at positions where they do not substantially face each other across the magneto-optic functional element.

20. The optical functional element comprising:

a magneto-optic functional element;

first and second birefringent plates formed alternately on one surface of the magneto-optic functional element; and

third and fourth birefringent plates formed alternately on the other surface of the magneto-optic functional element.

21. The optical functional element comprising:

a magneto-optic functional element;

first birefringent plates formed on one surface of the magneto-optic functional element at predetermined intervals; and

second birefringent plates formed on the other surface of the magneto-optic functional element at predetermined intervals.

22. A waveguide-embedded optical circuit comprising:

a waveguide;

a groove formed across the waveguide;

two or more embedded optical waveguide pairs whose members face each other across the groove; and

an optical functional element which can be inserted into the groove;

wherein the optical functional element has regions that pass light propagating through the embedded optical waveguide by way of the groove.